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EXAMINER

BHATNAGAR, ANAND P

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 04/13/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/865,137

Applicant(s)

WERNET ET AL

Examiner

Anand Bhatnagar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-18 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The method of calculating the mass flux based on the size of the particle and the velocity is not described in the specifications making it difficult for one skilled in the art to reproduce the results without trial and error. Examiner will address this claims and the claims dependent from it as best understood.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A.) Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mercadier et al. ("Reflectography applied to Optical Particle

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Sizing: Theoretical and Experimental approaches", Proc, 2<sup>nd</sup> Int. Cong. OPT.

Part. Siz, Tuscon, Arizona, pages 258-268, 1990) and Shambaugh (U.S. patent 5,231,463).

Regarding claims 1, 3, 7 and 8: A method for determining a mass flux of an entrained phase in a planar two-phase flow, the method comprising the steps:

recording images of particles in the two-phase flow (Mercadier et al. page 258 Introduction; where the size and velocity of the particles are going to be determined from recorded videos or photographs).

determining respective sizes of the particles as a function of a separation between spots identified on the particle images (Mercadier et al.; page 260 top half of page, where the reflection/glare spot off the particle is used to determine the size of the particle);

determining respective velocities of the particles (Mercadier et al.; page 262 last paragraph where the velocity of the particles can be determined) and

Mercadier et al. discloses to calculate the size and velocity of particles from the light intensity that is reflected off the particles/glare spots. Mercadier does not disclose to determine the mass flux of the particles based on size and velocity of the particles. Shambaugh teaches to determine the mass flux of particles (Shambaugh; col. 3 lines 61-67). It would have been obvious to one skilled in the art to combine the teaching of Shambaugh to that of Mercadier et al. because they are analogous in measuring particle characteristics using laser light scattering. One skilled in the art would have been motivated to combine the

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teaching of Shambaugh to that of Mercadier et al. in order to have a noninvasive, on-line measurement of the flow of fibers (Shambaugh; col. 3 lines 43-46).

Regarding claims 2 and 12: The method for determining a mass flux of a particle wherein the recording step includes:

recording an image of a transparent particle (Mercadier et al. page 258 Introduction; where the size and velocity of the particles are going to be determined from recorded videos or photographs).

Regarding claim 4: The method for determining a mass flux of a particle wherein the step of determining the velocity includes:

determining the velocity as a function of a velocimetry of the particles within the images. Shambaugh teaches to determine the velocity of a particle using Laser Doppler velocimetry. The obvious and the motivation are the same as claim 1.

Regarding claim 5: The method for determining a mass flux of a particle wherein the step of determining the velocity as a function of the velocimetry includes: It is rejected for the same reasons as claim 1 above and for the following limitation of two exposures (Mercadier et al.; page 260 last paragraph where it performed using multiple reflections, i.e. multiple exposures).

Regarding claim 6: The method for determining a mass flux of particle wherein the step of determining the velocity as a function of the velocimetry includes:

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detecting a Doppler shift of light (Shambaugh; col. 3 lines 50-52, where a Laser Doppler velocimetry method is used). The obvious and motivation are the same as claim 1.

Regarding claim 10: The optical flow meter for determining a mass flux of a particle wherein a Gaussian peak location estimate is used for determining a location of respective peaks of the glare spots, the separation between the glare spots being determined as a function of the locations of the peaks (Mercadier et al.; page 260 top half of page where the light intensities of the reflection of the particles are used to determine the particle size).

Regarding claim 11: The optical flow meter for determining a mass flux of a particle wherein the camera is a CCD camera. Examiner takes official notice.

B.) Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mercadier et al. ("Reflectography applied to Optical Particle Sizing: Theoretical and Experimental approaches", Proc, 2<sup>nd</sup> Int. Cong. OPT. Part. Siz, Tuscon, Arizona, pages 258-268, 1990) and Ishisaka (U.S.patent 6,289,126)

Regarding claim 13, 17, and 18: A method for determining a size of a particle, the method comprising: It is rejected for the same reasons as claim 1 above and for the following limitations of:

reducing background noise within the image; Examiner takes official notice.

Mercadier et al. discloses to obtain the size and velocity of particles based on the light intensity reflected from these particles. Mercadier et al. does not teach to group the pixels that are zero and non-zero pixels accordingly. Ishisaka teaches to detect the pixels that are zero and nonzero in the images (Ishisaka; col. 6 lines 52-67 and col. 7 lines 1-32). It would have been obvious to one skilled in the art to combine the teaching of Ishisaka to that of Mercadier et al. because they are analogous in analyzing flowing particles (Ishisaka; col. 6 lines 13-16). It would have been obvious to one skilled in the art to combine the teaching of Ishisaka to that of Mercadier in order to detect the edges of the particles/object (Ishisaka; col. 1 lines 15-20).

Regarding claim 14: The method for determining a size and a velocity of a particle wherein the reducing step includes:

limiting non-zero intensity values of pixels within the image (Ishisaka; col. 6 lines 52-67 where the pixels are filtered and thresholded. This is read as limiting the pixels).

Regarding claims 15 and 16: The method for determining a size and a velocity of a particle wherein the limiting step includes:

It is rejected for the same reason as claim 14 above and for the following limitation of setting a threshold at a level below a global threshold: It is obvious to one skilled in the art that a threshold can be set to any value within a given range parameters of the system.

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***Allowable Subject Matter***

3. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

King (U.S patent pub. 2003/0066358 A1) for particle mass flow rate.

***Contact Information***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anand Bhatnagar whose telephone number is (703) 306-5914, whose supervisor is Amelia Au whose number is 703-308-6604, group fax is 703-872-9306, and Tech center 2600 customer service office number is 703-306-0377.

AB

Anand Bhatnagar

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April 5, 2004



**SAMIR AHMED  
PRIMARY EXAMINER**